Update on uBooNE DAQ development effort in LCC.

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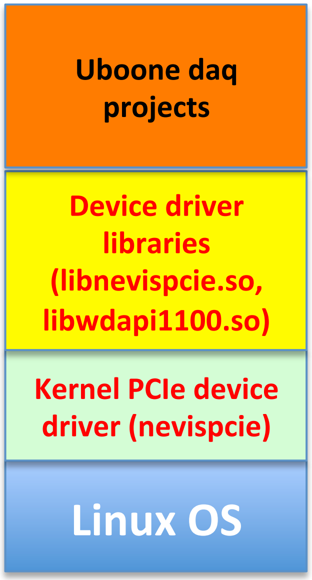
Outline

- Jungo windriver
- Event building with SEB / Assembler
- CET build tools
- CSS V3.1.1
- Near-term plans

Jungo Windriver

- Jungo windriver is available thru UPS
  - does not depend on the hardware identification and can be shared over NFS across all SEBs
  - has two key components: 1) a generic PCIe driver for talking to FPGAs and 2) a client library with a software license key compiled into it
  - needs to be rebuild into a separate UPS product after each linux kernel update/upgrade
    - the build script is in /uboone/windriver/v11_00_00
  - is not loaded on startup; (need to automate)
    - ksu
    - . /uboone/setup
    - **setup windriver v11_00_00 -f Linux64bit+2.6-2.12 -q debug**
    - wdreg windrvr6 #(or nevispcie)
    - chmod a+rw /dev/windrvr6 #(or nevispcie)
  - had to modify a couple of headers to compile with gcc4.6.2

Software stack



Uboone daq projects

Device driver libraries (libnevispcie.so, libwdapi1100.so)

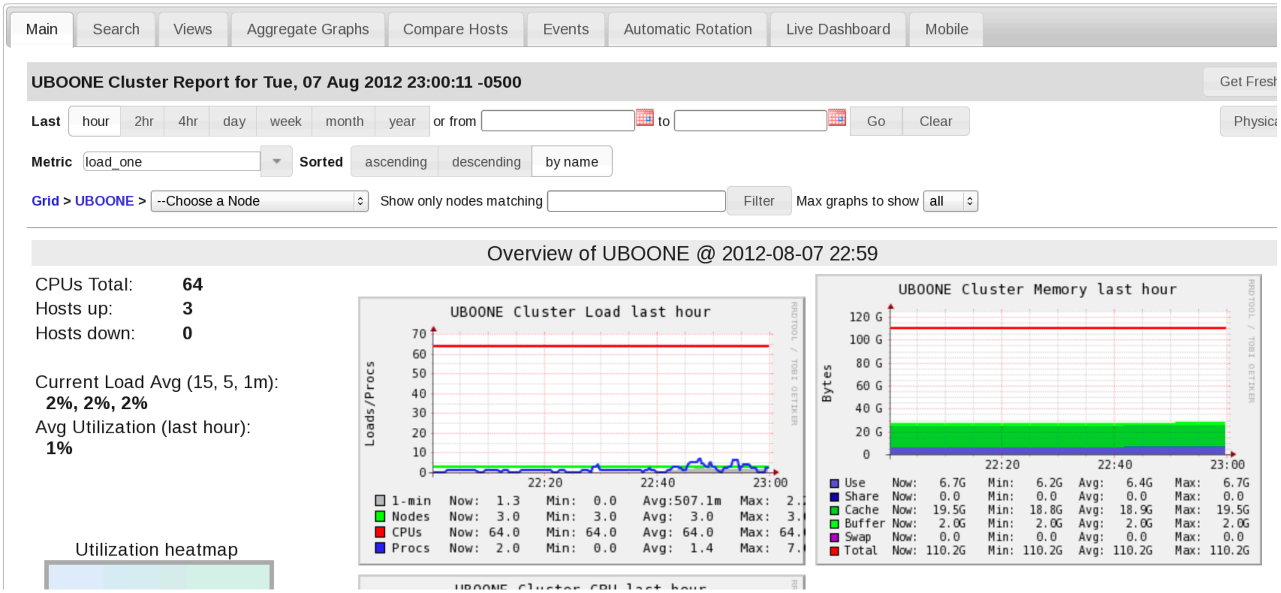
Kernel PCIe device driver (nevispcie)

Linux OS

Event building with SEB / Assembler

- SEB processes generate event fragments of variable length into a queue from which they are sent over a socket connection to the assembler process, which coalesces them into complete events and writes into a file.
  - all 10 SEB processes are started with ~/development/ uboonedaq/projects/tools/start-fake-sebs.sh on uboonedaq-seb-01
  - assemblerMain is started on uboonedaq-ebv
  - don't forget to setup your development environment on both seb-01 and evb machines
- Fragment send/receive data rates and fragment counts are posted to the ganglia online monitoring system
  - http://uboonedaq-evb.fnal.gov:8080/gweb

Ganglia screenshots


Main
Search
Views
Aggregate Graphs
Compare Hosts
Events
Automatic Rotation
Live Dashboard
Mobile
Get Fresh
Physica
Go
Clear
Filter
Utilization heatmap

UBOONE Cluster Report for Tue, 07 Aug 2012 23:00:11 -0500

Last hour 2hr 4hr day week month year or from to

Metric load_one Sorted ascending descending by name

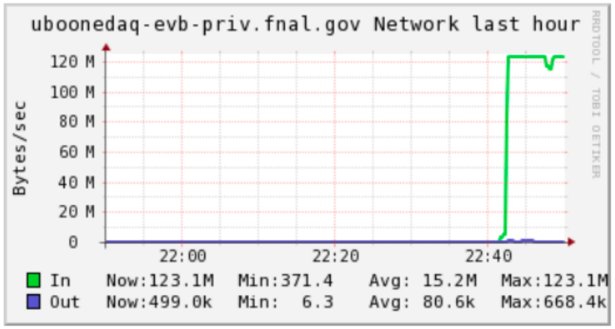
Grid > UBOONE > --Choose a Node Show only nodes matching Max graphs to show all

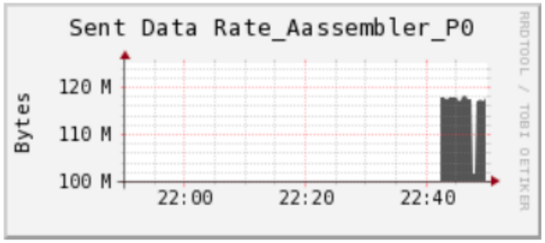
Overview of UBOONE @ 2012-08-07 22:59

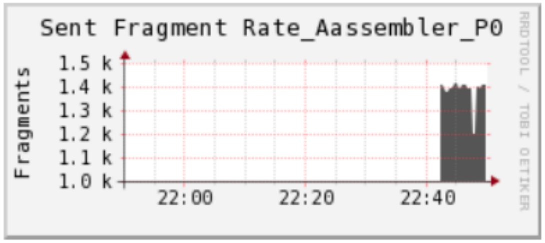
CPUs Total: 64
Hosts up: 3
Hosts down: 0

Current Load Avg (15, 5, 1m):
2%, 2%, 2%
Avg Utilization (last hour):
1%

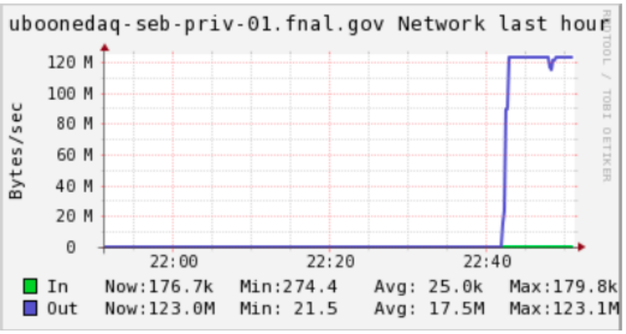
UBOONE Cluster Load last hour
Loads/Procs
70
60
50
40
30
20
10
0
22:20
22:40
23:00
RRDTOOL / TOBI OETIKER
□ 1-min Now: 1.3 Min: 0.0 Avg:507.1m Max: 2.
🟩 Nodes Now: 3.0 Min: 3.0 Avg: 3.0 Max: 3.
🟥 CPUs Now: 64.0 Min: 64.0 Avg: 64.0 Max: 64.
🟦 Procs Now: 2.0 Min: 0.0 Avg: 1.4 Max: 7.
UBOONE Cluster Memory last hour
Bytes
120 G
100 G
80 G
60 G
40 G
20 G
0
22:20
22:40
23:00
RRDTOOL / TOBI OETIKER
🟦 Use Now: 6.7G Min: 6.2G Avg: 6.4G Max: 6.7G
🟦 Share Now: 0.0 Min: 0.0 Avg: 0.0 Max: 0.0
🟩 Cache Now: 19.5G Min: 18.8G Avg: 18.9G Max: 19.5G
🟩 Buffer Now: 2.0G Min: 2.0G Avg: 2.0G Max: 2.0G
🟪 Swap Now: 0.0 Min: 0.0 Avg: 0.0 Max: 0.0
🟥 Total Now: 110.2G Min: 110.2G Avg: 110.2G Max: 110.2G
UBOONE Cluster CPU last hour

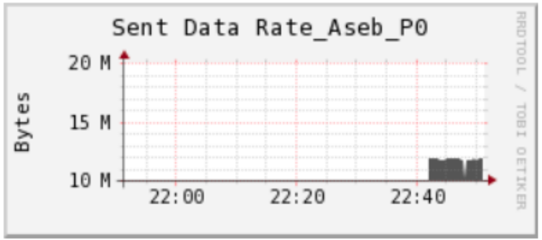


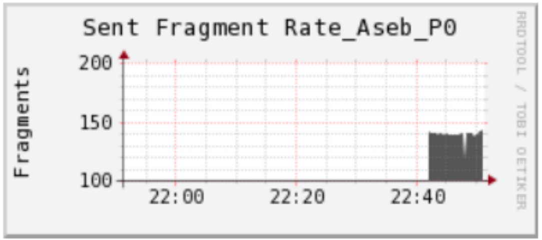




Plots show network activity, received data rates and received fragment rates monitored on the evb node.







Plots show network activity, sent data rates and sent fragment rates monitored on the seb10 node.

CET build tools

Build instructions:
https://cdcvs.fnal.gov/redmine/projects/uboonedaq/wiki/Setup-uboonedaq-for-development

CMakeLists.txt files follow all cmake rules and use time saving macros provided by the cetbuildtools package, which is available thru UPS and loaded by the setup_for_development script.

Uboone DAQ is using **git** for source control and does not provide any wrappers or change the interaction with the **git** repository. All **git** rules and commands are applicable. The *setup-development-source* script does "*git clone*" and "*git checkout cetcmake*".

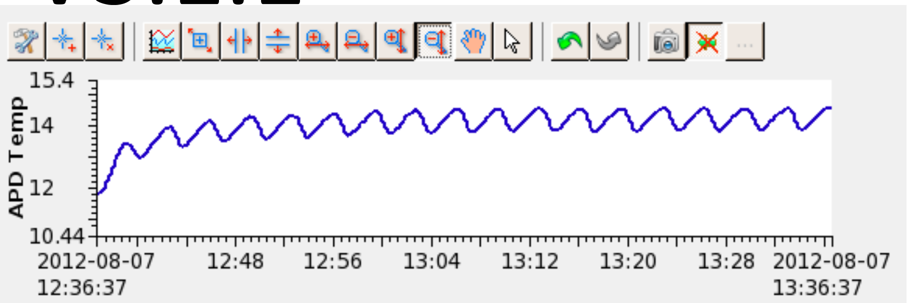
Steps to recreate your development environment

0. mv development development002
1. mkdir ~/development
3. export UBOONEDAQ_HOME_DIR=${HOME}/development
4. source /uboone/setup_online.sh
5. setup-development-source
6. kinit lukhanin
7. setup-development-source
8. cd ${HOME}/development/build
9. source ../uboonedaq/projects/ups/setup_for_development –d
10. cmake -DCMAKE_INSTALL_PREFIX=${UBOONEDAQ_HOME_DIR}/11. install -DCMAKE_BUILD_TYPE=$CETPKG_TYPE -Dqualifier:STRING=$CETPKG_QUAL $CETPKG_SOURCE
11. make -j32
12. . ~/development/install/setup
13. setup uboonedaq v1_00_00 -q debug:e1

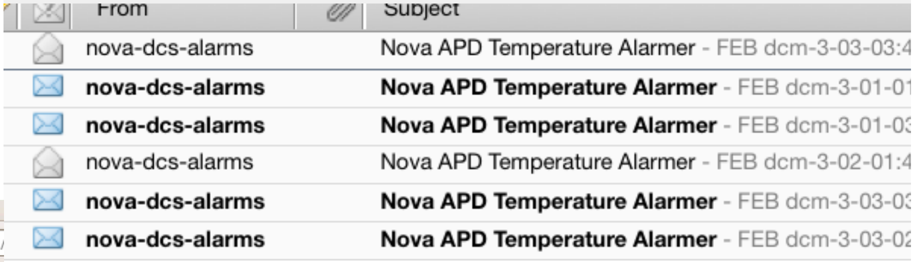
- **Use highlighted commands for running previously compiled code.**

CSS V3.1.1

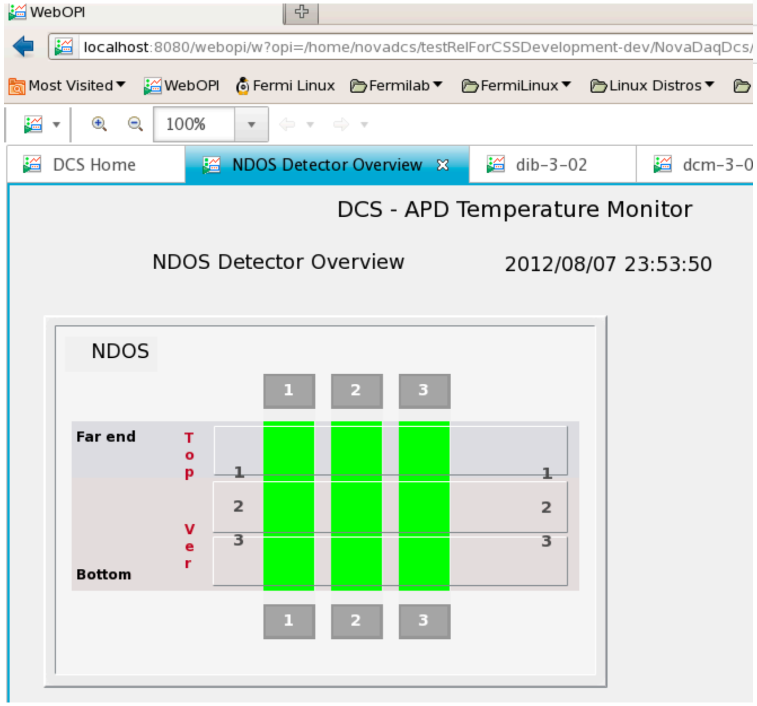
Data browser plugin shows data plots correctly from a database.



Alarms can trigger automatic actions such as sending email notifications and executing custom commands.



From	Subject
nova-dcs-alarms	Nova APD Temperature Alarmer - FEB dcm-3-03-03:4
nova-dcs-alarms	**Nova APD Temperature Alarmer** - FEB dcm-3-01-01
nova-dcs-alarms	**Nova APD Temperature Alarmer** - FEB dcm-3-01-03
nova-dcs-alarms	Nova APD Temperature Alarmer - FEB dcm-3-02-01:4
nova-dcs-alarms	**Nova APD Temperature Alarmer** - FEB dcm-3-03-03
nova-dcs-alarms	**Nova APD Temperature Alarmer** - FEB dcm-3-03-02



DCS - APD Temperature Monitor

NDOS Detector Overview 2012/08/07 23:53:50

Web OPI interface allows viewing OPI pages in a web browser.

Near-term plans

- Define uboone specific data structures for encapsulating event fragments and events.
- Automate jungo driver loading during linux boot.
- Implement reading event fragments from a Nevis card.
  - need a short document describing the communication protocol for the Nevis card and front-end electronics.
- Add state machines to both SEB and assembler applications.
  - we have a first version implemented in the SMC compiler language.